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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,787	10/21/2003	Martin W. Kendig	02RSC081	5614

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EXAMINER	
NOGUEROLA, ALEXANDER STEPHAN	

ART UNIT	PAPER NUMBER
1753	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/690,787	KENDIG ET AL.	
	Examiner	Art Unit	
	ALEX NOGUEROLA	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 1-17 is/are allowed.

6)☒ Claim(s) 18-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 21 October 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Al-Janabi et al. (US 6,621,263 B2) ("Al-Janabi") in view of Spellane (US 6,365,034 B1) ("Spellane") and Sekine ("Recent evaluation of corrosion protective paint films by electrochemical methods, *Progress in Organic Coatings* 31 (1997) 73-80) ("Sekine").

Addressing claims 18-21, Janabi discloses an apparatus for evaluating the corrosion resistance of a conductive material, comprising

a rotating disk cathode (58);

an anode (26);

a refercen elecreode (30);

an electrolytic solution (col. 06:10-18); and

a means for applying a voltage between the cathode and the anode (potentiostat, col. 06:56 – col. 07:34).

Janabi does not mention having the rotating disk cathode comprise an oxygen reduction catalyst, the cathode is made of mild steel (col. 04:60-61). However, in view of the variety of materials that Applicant considers to be oxygen reduction catalysts, such as platinum, copper, and carbon, mild steel can also be considered an oxygen reduction catalyst, especially since whether a conductive material can be an oxygen reduction catalyst depends merely on whether it can be used to apply an potential that reduces oxygen and since steel can rust under certain conditions. Moreover, the

cathode material is clearly the material whose corrosion resistance is to be measured, so the substitution of an oxygen reduction catalyst, such as copper, for mild steel (if it could be shown that mild steel is not an oxygen reduction catalyst) is just a matter of which conductive material has a corrosion resistance of interest.

Janabi also does not mention providing a coating in contact with the electrolytic solution. However, Janabi does state, "... the present invention is highly useful in determining the effectiveness of chemical corrosion inhibition programs in, for example wet-hydrogen sulfide containing environments under stimulated flow conditions" (col. 07:65 – col. 08:02). Spellane and Sekin teach electrochemical apparatuses for evaluating the corrosion inhibiting activity of a coating. The apparatuses comprise an electrode coated with the coating whose effectiveness is to be evaluated. See in Spellane col. 06:28-45 and in Sekine 1. Introduction and 2. Electrochemical methods. It would have been obvious to one with ordinary skill in the art at the time of the invention to coat the cathode in Janabi with a corrosion inhibiting coating as taught by Spellane and Sekine because then the effectiveness of the coating in protecting a particular conductive material could be determined. It should be noted that sine the coating will be directly on the cathode it will be positioned a predetermined distance of less than 1.00 mm (0.00mm, since directly on the cathode) from the cathode.

Allowable Subject Matter

5. Claims 1-17 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:

a) Claims 1, 10, and 11: each combination of limitations requires the steps of "providing a cathode comprising an oxygen reduction catalyst", "causing the electrolytic solution to flow laminarly between the coating and the cathode", and "measuring the oxygen reduction current flowing through the cathode under reproducible and constant hydrodynamic conditions."

Spellane (US 6,365,034 B1) discloses "[a] high throughput electrochemical test method for determining the resistance to corrosion of a metal article coated with a resinous coating." The only disclosed material for the cathode is aluminum, not an oxygen reduction catalyst, although the reference electrode may comprise an oxygen reduction catalyst, such as a graphite or platinum electrode. Since Spellane does not measure oxygen reduction current, but change in current density, which is correlated to pitting of the metal surface of the working electrode (cathode), there is no motivation to use a oxygen reduction catalyst, such as one listed in claim 2, for the cathode unless there was interest in how effectively the protective coating protects the oxygen reduction

catalyst. Even assuming that aluminum can be construed as a oxygen reduction catalyst or one of the claimed oxygen reduction catalyst is an obvious substitute for aluminum, Spellane does not disclose "causing the electrolytic solution to flow laminarly between the coating and the cathode." Spellane teaches away from this limitation because in Spellane the coating is baked onto the cathode. See the abstract; col. 04:27-33; and col. 06:22-59.

Bianco et al. (GB 2054865 A) discloses "[a] process for a rapid determination of the resistance to corrosion of an electrophoretic coating, ..." Bianco et al. does not mention particular materials for use as a cathode, so of "providing a cathode comprising an oxygen reduction catalyst" is not disclosed. Since Bianco et al. does not measure oxygen reduction current, but the time it takes for the current between cathode(s) and the reference electrode to reach a pre-established value, such as 1 A, there is no motivation to use a oxygen reduction catalyst, such as one listed in claim 2, for the cathode unless there was interest in how effectively the protective coating protects the oxygen reduction catalyst. Even assuming that one of the claimed oxygen reduction catalyst is an obvious cathode material, Bianco et al. does not disclose "causing the electrolytic solution to flow laminarly between the coating and the cathode." Bianco et al. teaches away from this limitation because in Bianco et al. the coating is deposited on the cathode by electrophoresis. See the abstract and page 02:24 – page 03:51.

The JPO machine English language translation of Shozo et al. (JP 08-068774 A) discloses a test method for anti-corrosion characteristic. In this method metal sample electrodes (1A-C), whose corrosion resistances are to be

evaluated, are plated in an electrochemical cell along with a counter/reference electrode (2). An active oxygen-generating source is also provided in the electrochemical cell along with an oxygen reducing coloring matter, which acts as an electrode mediator for the oxygen. Based on potential changes between the metal sample electrode and the counter/reference electrode the anti-corrosion characteristic of the metal material is evaluated. See the abstract and paragraphs [0012]-[0023] of the Detailed Description. Shozo et al. does not mention a coating and so does not disclose "causing the electrolytic solution to flow laminarly between the coating and the cathode." Moreover, as noted above Shozo et al. measures changes in potential difference due to oxygen reduction, not oxygen reduction current.

b) Claims 2-9 depend directly or indirectly from allowable claim 1.

c) Claims 12 and 13 depend directly or indirectly from allowable claim 11.

d) Claim 14: the combination of limitations requires "a means for causing said electrolyte solution to flow laminarly between the coating and said cathode."

Al-Janabi et al. (US 6,621,263 B2) discloses "[a] high-speed corrosion-resistant rotating cylinder electrode test apparatus for monitoring of corrosion rates of metals includes an electrochemical/permeation cell body adapted to contain a fluid whose corrosive effect is to be monitored,..." The electrode test apparatus comprises a cathode (58); an anode (26); and electrolytic solution (col. 06:10-18); a means for

applying a voltage between the cathode and the anode (col. 06:56 – col. 07:05 and col. 05:08-11); and a means for causing the electrolytic solution to flow laminarly (col. 04:55-59 and col. 04:60-61), wherein the cathode and the anode are in electrical contact with the electrolytic solution (col. 05:08-12). However, Al-Janabi et al. does not disclose having the cathode made of an oxygen reduction catalyst – it is made of mild steel (col. 04:60-61). Even assuming that mild steel can be construed as a oxygen reduction catalyst or one of the claimed oxygen reduction catalyst is an obvious substitute for mild steel and although Al-Janabi et al. states, "... the present invention is highly useful in determining the effectiveness of chemical corrosion inhibition programs in, for example wet-hydrogen sulfide containing environments under stimulated flow conditions" (col. 07:65 – col. 08:02), Al-Janabi does not mention providing a coating in the apparatus whose corrosion inhibiting activity is to be evaluated. Even if it were obvious to provide such a coating one with ordinary skill in the art would provide it as a coating directly on the cathode (for example as taught by Spellane or Bianco et al.), which although positioned at a distance of less than 1.00 mm from the cathode (0.00 mm, since directly on the cathode) would not be positioned so that electrolytic solution could flow laminalry between the coating and the cathode (that is >0.00 mm and <1.00 mm). Unlike in the apparatus of Al-Janabi et al., in Applicant's invention the cathode is not necessarily made of the same material that the coating is to protect. Al-Janabi determines corrosion resistance of the working electrode material from the current adjustments needed to maintain the potential between the working electrode and the reference electrode to a desired potential (col. 03:52-67). According to Applicant's invention "the

corrosion inhibiting activity of a coating is evaluated under well –defined hydrodynamic conditions. The corrosion inhibiting species are detected from the decrease produced in the oxygen reduction current at a catalytic cathode positioned very close to the coating surface" (page 07, lines 08-12 of the specification).

e) Claims 15-17 depend directly or indirectly from allowable claim 14.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alex Noguerola
Primary Examiner
AU 1753
May 9, 2007